

REMARKS

Entry of this Amendment and reconsideration are respectfully requested in view of the amendments made to the claims and for the remarks made herein.

Claims 1-13 are pending and stand rejected.

Claims 1 and 12 have been amended.

Claims 1 and 12 are independent claims.

The title is objected to for not being descriptive. Claims 1-4, 7 and 12-13 stand rejected under 35 USC §102(b) as being anticipated by Reddy (USP no. 6,175,355). Claims 5, 6, 8 and 11 stand rejected under 35 USC §103(a) as being unpatentable over Reddy in view of Koyama (USP no. 6,828,950). Claims 9 and 10 stand rejected under 35 USC 103(a) as being unpatentable over Reddy in view of Yamazaki (USP no. 7,145,536).

In maintaining the rejection of the claims the Office Action asserts that the PWM (pulse width modulation) of the pixels in Reddy discloses a first sub-period having a non-zero brightness level (PS0-PS7) and a second sub-period having a second non-zero brightness level (PS8-PS15), as expressed in Table 1, gray level 3. The Office Action further asserts that Ruddy further discloses the claim element "the time averaged sum of said brightness levels being substantially equal to said overall brightness level" in col. 1, lines 18-28 and col. 4, lines 7-10.

With regard to the rejection of the claims under 35 USC §102 as being anticipated by Reddy, applicant respectfully disagrees with and explicitly traverses the rejection of the claims. However, in the interest of advancing the prosecution of this matter, independent claim 1 has been amended to present the subject matter claimed in better form. More specifically, claim 1 has been amended to recite that brightness levels and associated sub-periods are selected so that time average sum of the brightness levels substantially achieves the overall brightness is associated with the image to be displayed. No new matter has been added. Support for the amendment may be found at least on page 6, lines 1-9 and in Figure 2.

Reddy discloses a technique for modulating pixels of a display panel for forming an image. Each pixel has an associated pixel frame that represents a period of time during which the pixel is modulated to achieve an appropriate grayscale level for the pixel. Each pixel frame includes a plurality of sub-frames. During each of the sub-frames, the pixel is placed in either an "on" condition or in an "off" condition according to a selected one of a plurality of predetermined grayscale sequences. Reddy further discloses offsetting each of the predetermined sequences based on the position of the pixel within a block (block dispersion). The offsetting is used to allow different start points among the sub-frames for different pixels.

Reddy illustrates a predetermined grayscale sequence (i.e., coding) in Table 2, wherein black represents an all-zero (0) condition and white represents an all-one (1) condition over each of the sub-frames within a pixel frame. A zero value represents an "on" condition and a 1 represents an "off" condition (see col. 3, lines 32-34).

According to the teaching of Reddy, the grayscale coding shown in Table 2 teaches that a desired level of intensity may be determined for each pixel with the selection of the appropriate grey scale sequence. That is, the intensity of the pixel may be determined by the number of "on" conditions that are presented in the selected grayscale sequence. For example, black is achieved by turning on the pixel for the entire sequence (all-zero) and white is achieved by turning off the pixel for the entire sequence (all-one). Thus, the grayscale coding disclosed by Reddy refers to turning "on" a pixel an appropriate number of times to achieve a desired intensity for the corresponding pixel.

Reddy further discloses that the selection of a grayscale sequence is determined based on the grayscale level for the pixel frame according to the image data to be displayed for the corresponding display frame (see col. 3, lines 34-37).

That is, Reddy discloses the selection of a particular grayscale sequence based on the desired intensity of the image data.

Even if the illustrated sub-frames of the grayscale sequence may be formulated into a first group (PS0-7) and a second group (PS8-15), the intensity (and the grayscale selected) of each pixels is based on the image data to be displayed for that pixel. That is, if the intensity of a pixel is to be white, then a predetermined grey scale sequence of "F" (all 1's) is selected. Whereas, if the intensity of a pixel is to be medium-grey, then a predetermined grey scale sequence of '8" (5555 base 16) is selected.

Reddy fails to disclose the determination of a first level of brightness and a second light of brightness and associated sub-periods such that the time average sum of the brightness levels of the two groups is substantially equal to the overall brightness level of the image, as is recited in the claims. Rather, Reddy teaches the selection of the grayscale sequence based on the image level itself.

A claim is anticipated if and only if each and every element recited in the claims is presented in a single prior art reference.

Reddy cannot be said to anticipate the subject matter recited in claim 1, as Reddy fails to disclose the selection of a first and second brightness levels such that the time sum average of the first and second brightness is substantially equal to the overall brightness level of the image, as is recited in the claims.

With regard to claim 7, applicant would note that Reddy teaches the generation of a control signal for each sub-frame associated with a selected grayscale sequence representing a pixel value. Hence, if first and second sub-periods refer to sub-frames PS0-PS7 and PS8-PS15, respectively, then Reddy cannot teach generating a control signal for the first sub-frame and a control signal for the second sub-frame as Reddy requires that a control signal be individually generated for each sub-frame, PS0 through PS15, of the grey scale sequence.

For the amendments made to the claims and for the remarks made herein, applicant submits that the reason for the rejection of claim 1 has been overcome.

Claims 2-4, 7 and 12-13 depend from claim 1, and, hence, are not

anticipated by Reddy by virtue of their dependency upon an allowable base claim.

Applicant respectfully disagrees with and explicitly traverses the rejection of claims 5, 6, 8 and 11 under 35 USC §103(a) as being unpatentable over Reddy in view of Koyama (USP no. 6,828,950).

Koyama discloses a display using a time gray-scale system in which one frame is divided into a plurality of sub-frame periods and a voltage is applied to an EL element is varied on a sub-frame period basis.

However, even if the varying voltage taught by Koyama is applied to the device of Reddy, the combination would not disclose the claim element that the first and second brightness levels and associated sub-frames are selected so that the time average sum of the two levels is substantially equal to the overall brightness level of the image, as is recited in the claims.

A claimed invention is prima facie obvious when three basic criteria are met. First, there must be some suggestion or motivation, either in the reference themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings therein. Second, there must be a reasonable expectation of success. And, third, the prior art reference or combined references must teach or suggest all the claim limitations. However, the Court in KSR v. Teleflex (citation omitted) has held that the teaching, suggestion and motivation test (TSM) is merely to be used as a helpful hint in determining obviousness and a bright light application of such a test is adverse to those factors for determining obviousness enumerated in the Graham v. John Deere (citation omitted).

In this case, even if there were some motivation to combine the teachings of the cited references, the combination of Reddy and Koyama fails to disclose a material element recited in the independent claims and thus, the combination of Reddy and Koyama cannot be said to render obvious the subject matter recited in each of the aforementioned claims.

Applicant respectfully disagrees with and explicitly traverses the rejection of claims 9 and 10 stand rejected under 35 USC 103(a) as being unpatentable over Reddy in view of Yamazaki (USP no. 7,145,536).

Yamazaki discloses a gray scale display utilizing a combined time ratio gray scale and voltage gray scale in a LCD device. Yamazaki discloses dividing a frame into sub-frames corresponding to the number of bits for the time ratio gray scale and an initial voltage is applied to the display in each sub-frame.

However, Yamazaki discloses a method to achieve a desired level of brightness for each pixel based on the image data.

Neither Reddy nor Yamazaki teaches selecting a first and a second level of brightness so that the time average sum of the two levels is substantially equal to the overall brightness level of the image, as is recited in the claims.

Accordingly, for the amendments made to the claims and for the arguments presented, herein, applicant submits that the rejection of each of the independent claims has been overcome and respectfully requests that the rejections be withdrawn.

Applicant denies any statement, position or averment stated in the Office Action that is not specifically addressed by the foregoing. Any rejection and/or points of argument not addressed are moot in view of the presented arguments and no arguments are waived and none of the statements and/or assertions made in the Office Action is conceded.

Applicant makes no statement regarding the patentability of the subject matter recited in the claims prior to this Amendment and has amended the claims solely to facilitate expeditious prosecution of this patent application. Applicant respectfully reserves the right to pursue claims, including the subject matter encompassed by the originally filed claims, as presented prior to this Amendment, and any additional claims in one or more continuing applications during the pendency of the instant application.

In the event the Examiner deems personal contact desirable in the disposition of this case, the Examiner is invited to call the undersigned attorney at the telephone given below.

Respectfully submitted,
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Date: September 17, 2009

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